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(54) PHOTOEXCITATION PRODUCTION OF FOUR COORDINATE BOND BN MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To enable the production of a semiconductor which requires high purity and a high degree of control in compsn. and structure by irradiating a raw material, such as boron nitride, formed by sp² hybrid bonding with a high energy density of ultra-short pulses of IR rays resonating with the out-of-plane vibration mode thereof.

SOLUTION: (i) Any of the powder, sintered compact or single crystal of any among BN consisting of the bonds by the sp² hybrid loci, i.e., hBN (hexagonal BN), rBN (rhombic BN), pBN (thermally decomposed BN), tBN (turbulent laminated structure BN), α -BN (amorphous BN) (these are described as an sp² phase) is used as the raw material and (ii) the raw material is irradiated at the high density with the ultra-short pulse laser beam resonating with the vibration mode displaced perpendicularly to the plane inclusive of the bonds consisting of the sp² hybrid loci, by which the four coordinate bond BN (described as the sp² phase), such as BN (cubic BN) or wBN (wurtzite type BN) material, consisting of the bonds by the sp³ hybrid loci is produced.

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(54) 【発明の名称】 四配位結合BN材料の光励起製造法

(57) 【要約】

【目的】 従来の高圧高温条件によらぬ四配位結合窒化ホウ素、即ちcBN、wBN等の製造法を提供する。

【構成】 sp^2 混成結合による窒化ホウ素、hBN等の無処理あるいはドーブ用の処理をした原料にその面外振動モードに共鳴する赤外線の超短パルスの高エネルギー密度の光を照射して四配位結合窒化ホウ素を製造する。付随する処理法により半導体素子の構造と機能を作り込む。

